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Kentucky's Potential Target Industry Sectors

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Kentucky Sector Strategies

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Identifying Target Industries

Introduction

Today's economic environment is fraught with uncertainties about market behavior, government regulation, and intervention. As a result, the economic landscape—especially in the discipline of business growth, job creation, and workforce development—has also changed. New large-scale manufacturing operations are less commonplace as companies seek to minimize costs. However, pockets of industry growth have occurred within sectors and the economic development theme of cluster-based sector strategy approaches and targeted investment has increasingly become the mantra of national, state, and local policymakers.

It should be noted at the outset that a sector-based strategy approach is not a new concept; the idea and practice of developing regional sectors, clusters, and agglomeration economies has existed since 1890. What has significantly changed are the processes prescribed to identify, classify, and target sectors for development. As data become more accessible (and accurate), new approaches to identifying sectors have been and are currently being developed. Some current systems include the Cluster Mapping Project developed by the Institute for Strategy and Competitiveness at Harvard Business School, as well as the Industry, Occupation, and Innovation Clusters developed through an Economic Development Administration Grant to Indiana University and Purdue University. These systems account for several measured variables of employment and job growth to describe regional clusters.

This study utilizes a similar approach as the aforementioned systems to identify potential target sectors for the Commonwealth of Kentucky. However, the consulting team has incorporated additional data variables to help ensure that recommended potential industry sector targets are a strong fit for a given geographic area. Furthermore, though not explicit in the initial identification of industry sector targets, qualitative considerations (*e.g.*, political environments, social acceptance, collaborative decision-making networks, *etc.*) are encouraged to amplify the data analysis with on-the-ground knowledge and expertise. This qualitative aspect is designed to help narrow identified sectors, as well as prioritize sectors based on factors that are not easily measured.

Data-Driven Approach

In economic development, especially that which is focused around industry and workforce development, data analysis is a crucial element. Data provide a descriptive component of what has happened, what is currently happening, and what is projected to happen within a given industry. Moreover, data can be evaluated from varying perspectives to provide a larger context of economic understanding. For example, geographically-specific data can give stronger understanding of regional-specific effects when compared to a larger geography (*e.g.*, state and nation) and indicate whether a region may have a comparative advantage in a particular sector. In order to capture multiple viewpoints of historical and projected industry performance, project partner EMSI gathered, developed, or calculated metrics to describe the following industry characteristics:

1. Historical Growth;
2. Future Growth Projection;
3. Industry Concentration (Location Quotient);
4. Industry Competitive Effects (Shift Share Analysis);
5. Export Orientation;
6. Job Multiplier Effects;
7. Earnings Multiplier Effects;
8. Industry Average Wage;
9. Excess Demand; and
10. Workforce Compatibility.

Each characteristic provides a different perspective of industry performance, regional fit, or economic ripple effects for 1079 six-digit NAICS categories.

Size and Historical Growth: Measures the current employment and past performance of an industry sector and identifies whether industries have been growing/declining/emerging and the rate of change.

Future Growth Projection: Incorporates historical growth and performance with additional factors and expectations of growth/decline at a larger geographic scale (*i.e.*, state or nationwide and even global expectations). Industry projection rates are based on Kentucky's Office of Employment and Training projections and adjusted to current employment estimates.

Industry Concentration (Location Quotient): The location quotient variable is a comparative statistic used to calculate relative employment concentration of a given industry against the average employment of the industry in a larger geography (*e.g.*, nation). Industries with a higher location quotient (usually greater than 1.2) indicate that a region/state has a comparative advantage or specialization in the production of that good or service.

Industry Competitiveness Effect (Shift Share Analysis): A standard method of regional economic analysis that attempts to separate regional job growth into its component causes. The three main causes identified are the "national growth effect," which is regional growth that can be attributed to the overall growth of the entire U.S. economy; the "industrial mix effect," which is regional growth that can be attributed to positive trends in the specific industry or occupation at a national level; and the "regional competitiveness effect," which is growth that cannot be explained by either overall or industry-specific trends. A positive value indicates that an industry has a competitive advantage compared to the nation. Note: Positive shift share values do not explain why an industry has a competitive advantage, only that there are potential factors that contribute to the industry's ability to outperform the national average rate of growth/decline.

Export Orientation: This variable can be measured in more than one way. Through the development of an input-output model, metrics estimating export amounts can be calculated for each six-digit NAICS code. Since employment levels vary significantly between industries, production output and export amounts also vary. To account for this and provide a comparable metric, percent exports per job were calculated. Industries that predominately export their product bring new money into the economy, which in turn drive many other local sectors and service providers. Furthermore, export-oriented industries that require less labor input per unit of output can generate significant amounts of new dollars for an economy through job and output growth. Knowing these sectors helps to understand the economic benefits gained from targeted sector strategies.

Job Multiplier Effects: A jobs multiplier indicates how important an industry is in regional job creation. For example, a jobs multiplier of 3 would mean that for every job created by that industry, 2 other jobs would be created in other industries (for a total of 3 jobs). Higher job multipliers in industries that are associated with higher-average wages tend to have larger positive impacts on an economy.

Earnings Multiplier Effects: An earnings multiplier indicates the level of additional earnings associated with adding one new dollar of earnings to an industry in an economy. This variable is important in understanding how targeted investment in an industry (especially higher-paying industries) affects the overall quality of jobs created.

Industry Average Wage: This metric is calculated based on an industry staffing pattern and the average occupational wage associated with that staffing pattern. The industry average wages provides a perspective on the quality of jobs within a given industry, answering the question of whether the industry typically provides family-sustaining wages.

Excess Demand: Measured using an input-output model, excess demand can also be viewed as regional imports. The metric describes how much of a good or service is purchased from outside the area and can indicate the area's inability to produce its own supply. The consulting team cautions against over-interpreting this variable, as cross-hauling (inter-regional and inter-state trade) does exist due to specialization in other areas. However, if a region or state has a high level of industry requirements and is only producing a small portion of output to meet those requirements—with the remaining amount being imported—then an opportunity may exist to further develop that particular industry. This would be considered a demand-driven industry development approach.

Workforce Compatibility: The compatibility metric is derived from a proprietary dataset developed by EMSI, which utilizes measured O*NET occupational competencies to identify similarities in skill sets. The metric in this analysis is important for one reason, specifically: to provide an understanding of the capabilities of a region/state's workforce to fill the labor needs within a given industry, especially the higher-skilled labor needs (measured using O*NET Job Zone codes 3 and higher). For example, if half of an industry's labor needs are high-skill workers and a third of the regional workforce can fill those labor needs, we would conclude that the industry is a good fit for the region's workforce capabilities.

Current Proposed Industries (Data-Driven Approach)

As mentioned in the introduction, pockets of growth within industry categories have occurred nationally, as well as within Kentucky. For example, to say that manufacturing is in decline is an over-simplified statement. At a high level, the manufacturing industry is losing jobs. Yet, at a more granular level, certain sectors within manufacturing have experienced significant growth. In fact, the top 50 fastest-growing manufacturing sectors in Kentucky have added almost 20,000 new jobs to the Commonwealth's economy since 2002.

The sectors identified, using the above analysis, are not necessarily all-encompassing. For instance, food and beverage manufacturing consists of 48 six-digit NAICS categories (not including tobacco product manufacturing). Of these categories, 26 industries have experienced growth over the past decade equal to almost 4,500 new jobs. The remaining 22 sectors have seen decline equal to roughly 2,370 jobs. The food and beverage manufacturing sector NAICS definition will focus more on the sectors that have grown and/or are projected to grow, rather than the sectors that have experienced significant decline.

Lastly, geographic distribution is also considered when making final industry cluster selections. Industries that have a larger statewide presence were favored when making the final selection, since some industries can be more geographically-focused within the Commonwealth. The list below summarizes the potential target industry list. More detailed NAICS data and employment distribution maps are provided in Appendix A.

- Automobile and Aircraft Manufacturing
- Transportation, Distribution and Logistics
- Business Services and Research and Development
- Health Care/Social Assistance
- Energy Creation/Transmission

Automobile and Aircraft Manufacturing: Focuses on industries engaged in the development of aircraft assembly, prototype development, conversion, and overhauling/rebuilding. Industries that manufacture aircraft components are also categorized in this sector.

Transportation, Distribution and Logistics: Focuses on the movement and storage of goods and support activities related to different modes of transportation. Specific modes of transportation include water, rail, road, and air.

Business Services and Research and Development: Consists of industries that specialize in performing professions, scientific and technical services for others, including research and development.

Health Care/Social Assistance: This sector involves industries involved in the provision of health care and social assistance to individuals, delivered by health or social service practitioners.

Energy Creation/Transmission: Focuses on sectors engaged in the creation of energy (*e.g.*, coal, gas, wind, *etc.*), transmission of energy (power-lines, pipe, *etc.*) and support the creation and distribution of energy.[1]

Qualitative Approach

The above list of proposed industries results from a thorough and professional review of economic and workforce information. From a quantitative perspective, it offers a detailed assessment based on commonly-used datasets to reflect the strengths of Kentucky's economy.

However, what the proposed list does not do (and cannot do alone) is reflect the qualitative factors that need to become part of every community's assessment. Qualitative factors are difficult to predict because they are (by their nature) varied and diverse—changing from region to region. We can, though, point regional and statewide leaders to various qualitative elements when selecting a final list of target sectors, some of which are as follows:

1 The definitions of industry sectors are taken (in part or in full) from definitions developed by the U.S. Census Bureau in the NAICS system. http://www.census.gov/eos/www/naics/index.html

- ***New and current initiatives not reflected in historical data.*** Examples of such issues might be new initiatives to develop research centers in a new industry sector (*i.e.*, green energy) or breakthrough R&D that is heading to commercialization.
- ***Tacit knowledge of your leadership.*** No dataset can reflect the key knowledge that community leaders might possess. Current initiatives with community partners (*i.e.*, a policy driven by economic development partners or political considerations) and other factors may be important to consider when making final decisions. In other words, tacit knowledge is seldom considered exclusive of the quantitative analysis, but may further advise the prioritization and final decision-making process.
- ***Cultural issues.*** Community leaders have the context to consider factors that might be cultural, such as a bias against office parks or towards "green" initiatives. These issues should inform decision-making.

The leadership is highly encouraged to evaluate the suggested industries to determine what other factors may provide a stronger competitive advantage for the list. Additionally, industry sectors that may be missing, due to a lack of historical and current data, might also be considered. For example, no employment and industry data currently exist for nuclear power generation. However, if the Commonwealth were going to invest significant amounts of money into nuclear power development, this industry should be incorporated into the overall energy sector targeted industry definition.

The consulting team is creating a "Consensus-based Decision-Making Process" that will, in part, allow for a framework within which both qualitative and quantitative data will be used in prioritizing the aforementioned list of potential targeted sectors.

Appendix A – Detailed Industry Sector Information

Information on sectors presented in this appendix include the following:

1. Historical employment and future employment projections;
2. Wages, industry concentration (location quotient), competitiveness (shift share);
3. Excess Demand (estimated imports);
4. Skilled workers in sector and compatibility of workforce;
5. Employment distribution by county; and
6. Historical employment change (2002–2010) by county.

Summary Table

The summary table presents an overview of the sectors. As can be seen, all sectors have an average wage that exceeds $30,000 a year in full-time earnings. Additionally, most sectors are projected to grow substantially over the next several years.[2] Out of the top five sectors, energy creation/transmission; business services and R&D; and health care/social assistance require higher amounts of skilled labor. Automotive and aircraft manufacturing and transportation, distribution and logistics sectors are heavily concentrated in the Commonwealth, as compared to the nation.

Description	Average Wage	2002 Jobs	2010 Jobs	Change	2010 National LQ	2010–2018 Projected Change	Jobs Mult	Imports(K)	2009 Estab	Shift Share	% Skilled *	% of Workforce Compatible
Automotive/Aircraft Manufacturing	$ 19.12	54,841	40,683	(14,214)	2.38	(7,024)	3.9	$2,090,079	1,896	8244	28%	22%
Energy Creation/Transmission	$ 21.67	11,654	14,056	2,402	1.02	(945)	3.7	$1,723,119	625	1,027	43%	17%
Transportation, Distribution, Logistics	$ 17.44	71,763	80,824	9,061	1.65	11,120	2.0	$ 604,932	2,459	3,739	14%	27%
Business Services and R&D	$ 21.95	84,408	111,120	26,712	0.71	32,214	2.0	$9,368,568	9,397	13,034	48%	22%
Health Care/Social Assistance	$ 19.58	209,060	244,941	35,881	0.96	42,907	1.8	$2,113,895	9,968	(6,755)	47%	22%

* Skilled occupations for this analysis are considered to be O*NET Job Zone Codes 3, 4 and 5. For a more detailed description, visit: http://www.onetonline.org/help/online/zones

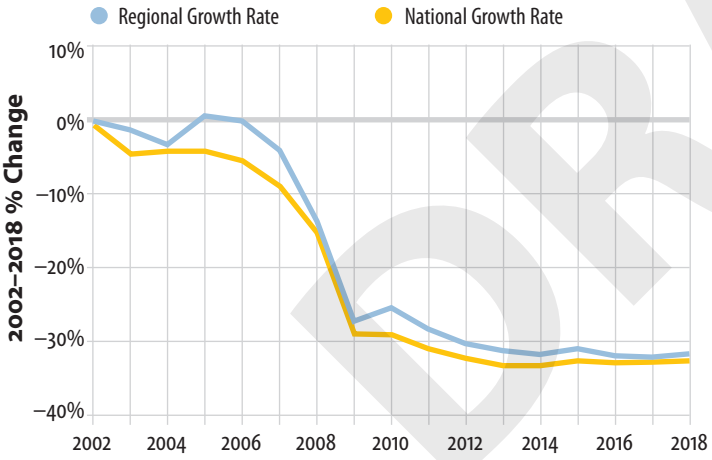
Source: EMSI Complete Data – 3rd Quarter 2010.

2 Aircraft and automotive manufacturing has not accounted for the new Ford Motor Co. expansion of 1,800 new jobs, though this analysis is available later in the Appendix.

Automobile and Aircraft Manufacturing

The automobile and aircraft manufacturing industry has seen significant decline over the past several years, predominately from the automobile and auto parts manufacturing sectors. However, in the last year, a slight rebound in the industry can be seen. Overall projections for the industry show minimal growth, though the aircraft and other motor vehicle part manufacturing industries are projected to experience considerable growth. A recent announcement by Ford to invest $600 million to overhaul an existing Louisville plant is expected to add an additional 1,800 jobs to the automobile manufacturing sector. Additionally, a summary impact model estimates an additional 17,000 jobs added to the auto sector, stemming from supply-chain effects of the Ford plant expansion.[3]

Basic Information[4]



Description	2002 Jobs	2018 Jobs	Change	% Change	2010 EPW	2010 Establishments
State Total	55,330	37,739	-17,591	-32%	$72,120	243
National Total	1,564,132	1,055,596	-508,536	-33%	$85,828	12,813

Source: EMSI Complete Employment—4th Quarter 2010

3 Estimates are based on an input-output model for light truck and utility vehicle manufacturing and assumes the bulk of automobile inputs will be provided by companies currently located within the Commonwealth. Typical job multiplier effects for this industry range between 6 and 11 additional jobs created for every one job created in automobile manufacturing.

4 Region denotes the Commonwealth of Kentucky

Industry Summary Table

Based on industry data, the sector is very export-oriented, meaning a strong proportion of the industry sector's output is exported to areas outside the Commonwealth. This brings new money into the state, which is circulated to create larger ripple effects. Analysis of the Commonwealth's workforce compatibility indicates that of the higher-skilled occupations in the sector, roughly 1 out of 5 workers' skill sets are highly compatible with the industry's high-skill needs.[5]

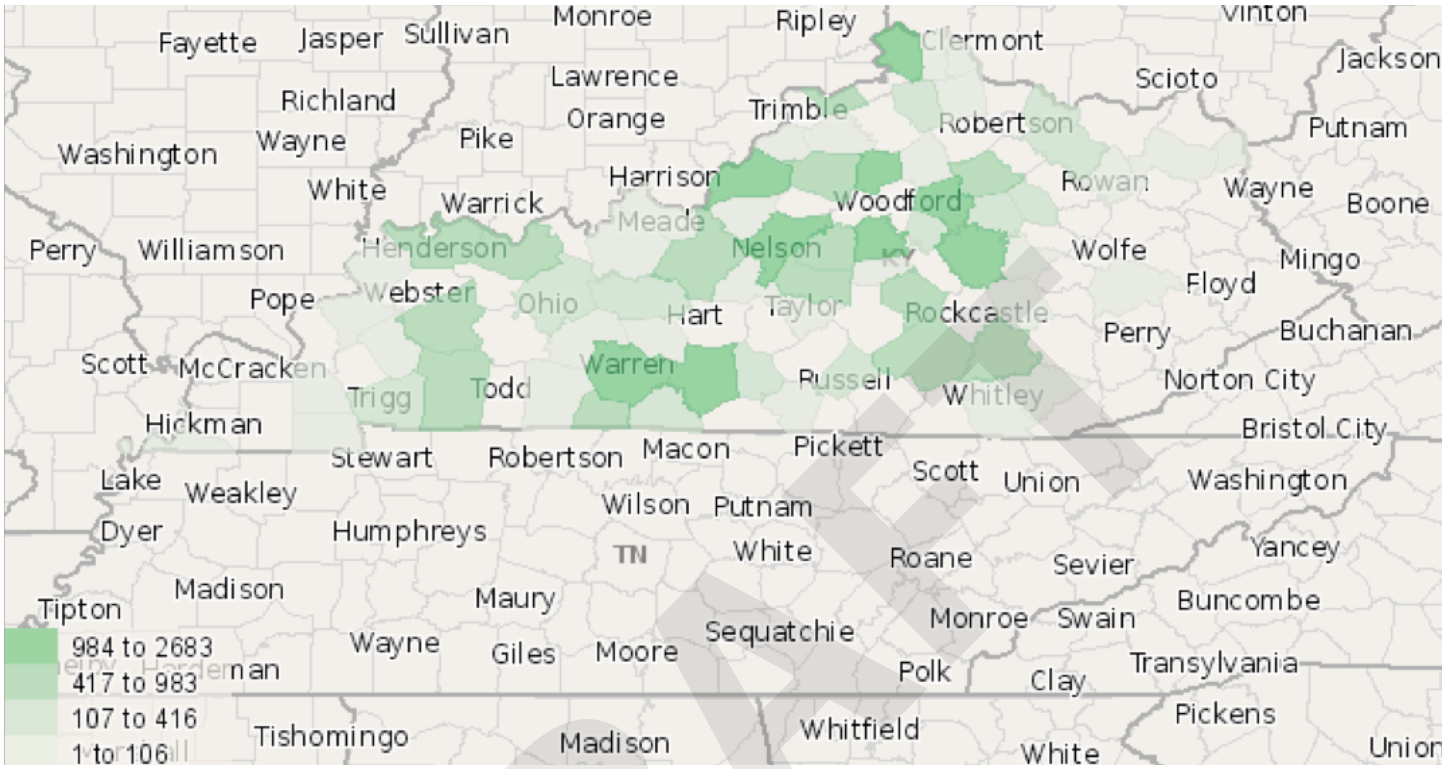
NAICS Code	Description	Average Wage	2002 Jobs	2010 Jobs	Change	2010 National LQ	2010–2018 Projected Change	Jobs Mult	Earnings Mult	Total Req's (K)	Imports (K)	Exports per job (K)	2009 Estab	Shift Share
336111	Automobile Manufacturing	$18.34	9895	8087	(1808)	6.11	287	4.5	2.6	$1,095,576	$65,155	409	92	266
336112	Light Truck and Utility Vehicle Manufacturing	$19.57	9127	3826	(5301)	7.69	(2872)	10.6	5.7	$1,513,160	$86,437	1,498	7	37
336120	Heavy Duty Truck Manufacturing	$13.98	732	190	(542)	0.6	(154)	4.5	3.4	$204,974	$87,767	32	214	177
336211	Motor Vehicle Body Manufacturing	$20.65	1745	768	(977)	1.08	(219)	1.9	1.8	$180,675	$88,147	6	121	385
336212	Truck Trailer Manufacturing	$24.24	506	458	(48)	1.49	72	2.6	2.3	$77,313	$10,716	65	8	218
336213	Motor Home Manufacturing	--	0	0	--	--	--	--	--	$ 83,904	$ 83,904	--	0	--
336214	Travel Trailer and Camper Manufacturing	$18.99	281	104	(177)	0.3	(43)	2.8	2.6	$104,018	$80,805	12	59	79
336311	Carburetor, Piston, Piston Ring, and Valve Manufacturing	$16.46	1062	367	(695)	3.13	(274)	3.0	2.5	$87,998	$11,460	93	55	62
336312	Gasoline Engine and Engine Parts Manufacturing	$17.87	1,074	1,265	191	2.61	(65)	3.0	2.5	$470,853	$169,299	13	15	739
336321	Vehicular Lighting Equipment Manufacturing	$17.87	10	117	107	0.67	13	2.4	2.5	$101,061	$83,968	8	2	111
336322	Other Motor Vehicle Electrical and Electronic Equipment Manufacturing	$24.88	3777	1569	(2208)	2.83	(1150)	2.5	2.5	$477,516	$150,272	11	737	45
336330	Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing	$17.18	2800	1923	(877)	5.7	(903)	3.2	2.5	$301,892	$27,631	157	3	43
336340	Motor Vehicle Brake System Manufacturing	$24.55	3663	2686	(977)	7.95	(1043)	3.0	2.5	$263,395	$19,032	177	76	393
336350	Motor Vehicle Transmission and Power Train Parts Manufacturing	$22.01	1676	1117	(559)	1.52	(526)	3.0	2.5	$739,566	$465,874	13	35	27
336360	Motor Vehicle Seating and Interior Trim Manufacturing	$16.45	6193	3326	(2867)	5.74	(1904)	3.1	2.5	$362,709	$26,066	179	340	49
336370	Motor Vehicle Metal Stamping	$14.75	4819	3968	(851)	5.31	(1290)	3.0	2.5	$674,236	$64,647	109	60	406
336399	All Other Motor Vehicle Parts Manufacturing	$17.87	5,665	7,480	1,815	4.89	2,740	3.0	2.5	$938,671	$69,826	125	56	3555
336411	Aircraft Manufacturing	$24.24	793	2,123	1,330	0.69	428	2.4	1.8	$837,127	$405,899	34	4	1302
336412	Aircraft Engine and Engine Parts Manufacturing	$24.24	867	1,005	138	0.93	(218)	2.8	1.9	$115,390	$22,386	198	8	218
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	$24.20	156	248	92	0.19	51	2.6	2.1	$111,076	$88,283	147	6	77
336999	All Other Transportation Equipment Manufacturing	$18.35	<10	56	--	--	46	3.8	2.3	$101,362	$66,409	33	--	53
	Total	$19.12	54,841	40,683	(14,214)	2.78	(7,024)	3.4	2.6	$8,758,568	$2,090,079	0.000001	1,896	--

* Skilled occupations for this analysis are considered to be O*NET Job Zone Codes 3, 4 and 5. For a more detailed description, visit: http://www.onetonline.org/help/online/zones

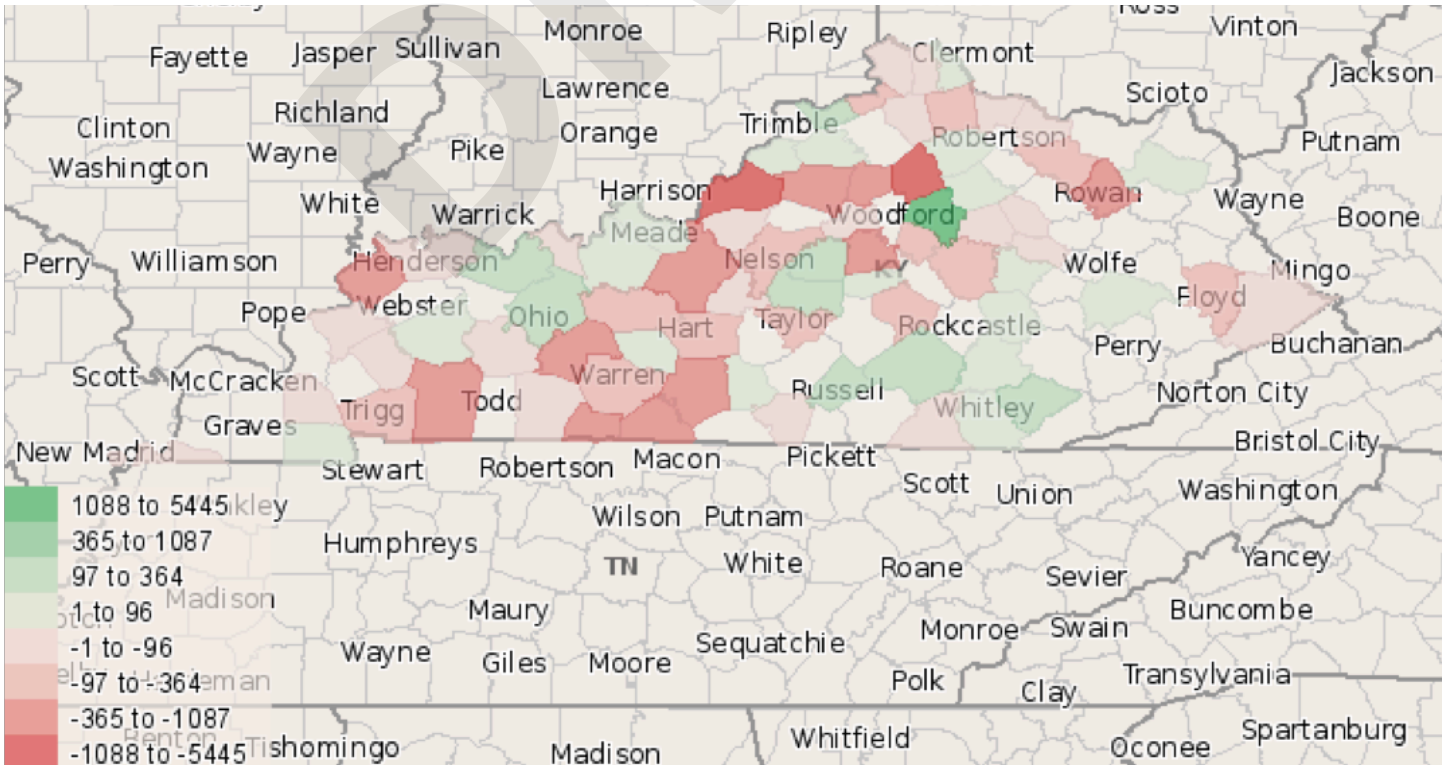
Source: EMSI Complete Data – 3rd Quarter 2010.

5 Skilled occupations are those categorized as O*NET Job Zone 3 or higher. EMSI used a methodology of matching highly compatible occupations based on O*NET knowledge, skills and ability measurements to a staffing pattern matrix of the sector. This list of direct and compatible occupations was then compared to Commonwealth's workforce to determine workforce compatibility to the target sector.

Automobile and Aircraft Manufacturing 2002–2010 Employment Change[6]



Auto/Aircraft Manufacturing Employment Distribution

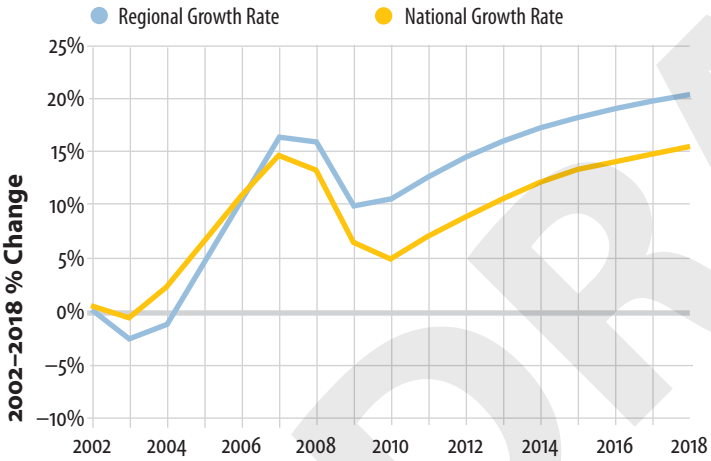


6 Employment change refers to historical employment change and does not take into account projected expansions

Transportation, Distribution, and Logistics (TDL)

TDL experienced significant growth between 2003 and 2007, followed by moderate decline between 2008 and 2009. Between 2009 and 2010 this sector experienced a slight recovery and is projected to grow over the next several years, adding significant amounts of jobs in trucking, warehousing/storage, courier services, and logistics/freight arrangement.

Basic Information[7]



Description	2002 Jobs	2018 Jobs	Change	% Change	2010 EPW	2010 Establishments
State Total	71,763	86,506	14,743	21%	$56,817	2,412
National Total	3,383,353	3,911,511	528,158	16%	$53,568	147,264

Source: EMSI Complete Employment—4th Quarter 2010

7 Region denotes the Commonwealth of Kentucky

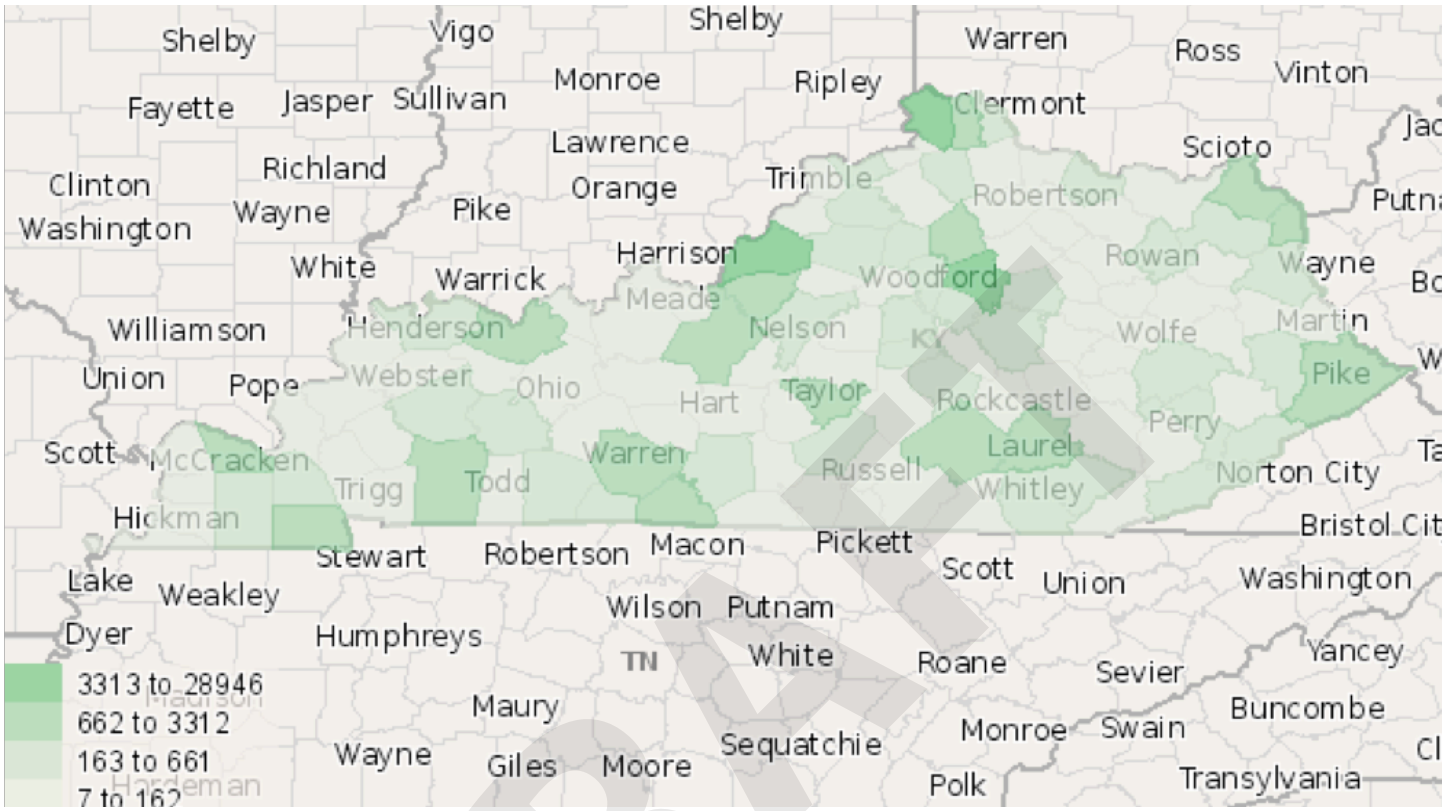
Industry Summary Table

The data indicate that a significant amount of additional demand still exists in many TDL industries, most notably freight transportation arrangement; general freight trucking; other support activities for air transportation; and refrigerated warehouse and storage. Evaluation of the Commonwealth's workforce indicates that approximately 1 out of 4 mid to high-skilled workers are highly compatible with the skilled workforce needs of the TDL sector.

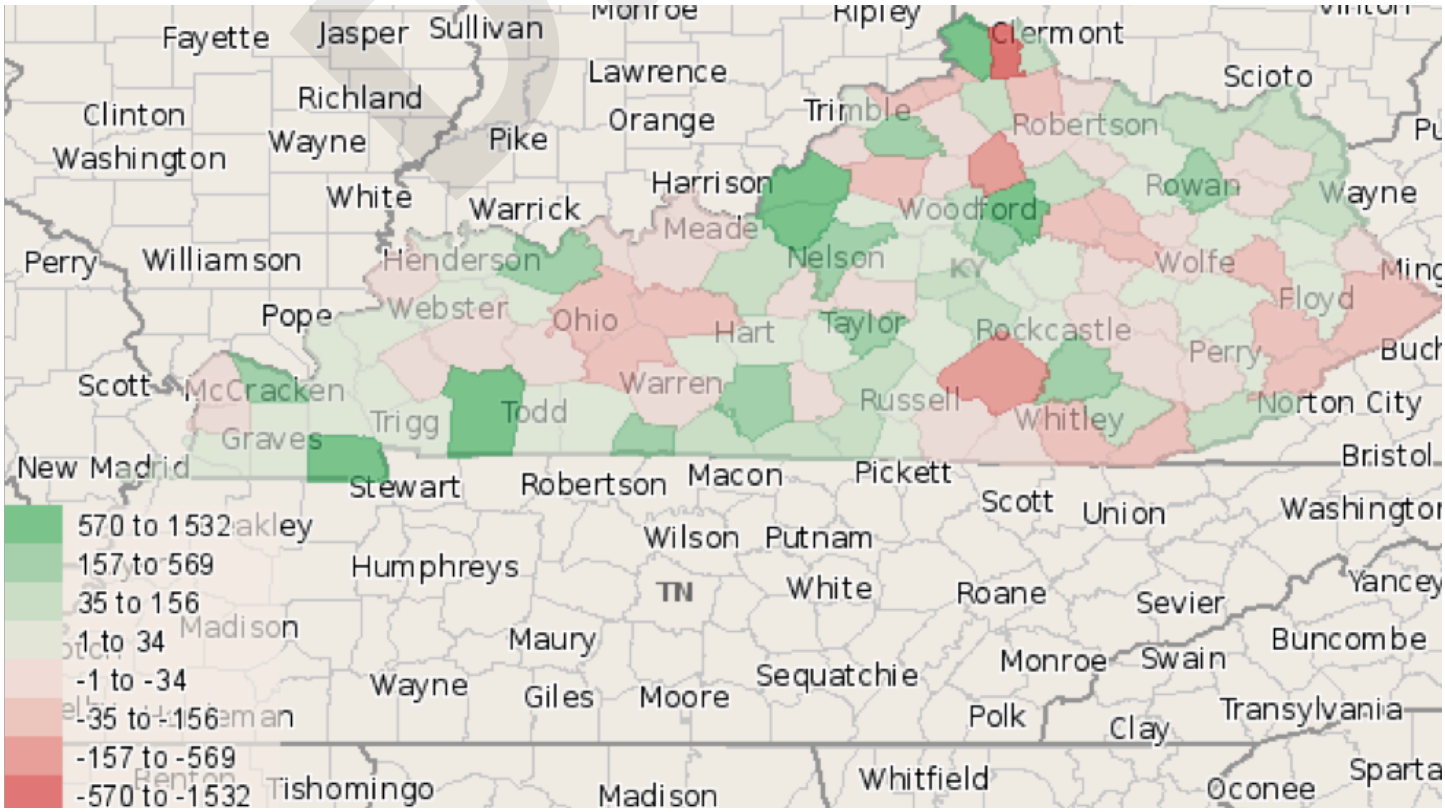
NAICS Code	Description	Average Wage	2002 Jobs	2010 Jobs	Change	2010 National LQ	2010–2018 Projected Change	Jobs Mult	Earnings Mult	Total Req's (K)	Imports (K)	Exports per job (K)	2009 Estab	Shift Share
482110	Rail transportation	$22.23	5,207	4,920	(287)	1.43	(200)	2.9	1.8	$1,302,677	$65,134	49	3	(168)
483211	Inland Water Freight Transportation	$21.58	923	1,788	865	5.74	173	4.6	2.8	$95,910	$4,796	353	26	591
483212	Inland Water Passenger Transportation	$24.23	33	34	1	0.41	(2)	3.2	2.8	$16,853	$7,749	19	4	(8)
484121	General Freight Trucking, Long-Distance, Truckload	$18.56	12,519	12,503	(16)	1.14	1,289	2.2	2.0	$1,642,317	$117,984	6	400	(543)
484122	General Freight Trucking, Long-Distance, Less Than Truckload	$18.42	2,958	4,141	1,183	1.24	969	2.5	2.0	$578,577	$28,929	24	175	1,199
484220	Specialized Freight (except Used Goods) Trucking, Local	$17.98	5,251	4,743	(508)	1.52	213	2.0	2.0	$409,938	$20,497	29	732	(616)
484230	Specialized Freight (except Used Goods) Trucking, Long-Distance	$17.74	1,603	2,229	626	1.37	766	2.3	2.0	$240,121	$12,006	38	173	573
485991	Special Needs Transportation	$12.57	559	863	304	0.84	133	1.4	1.5	$39,542	$2,114	2	26	5
485999	All Other Transit and Ground Passenger Transportation	$12.65	244	663	419	1.38	12	1.3	1.5	$19,492	$975	7	22	371
488111	Air Traffic Control	$20.72	11	13	2	0.33	(2)	1.8	1.5	$4,674	$3,135	8	3	4
488119	Other Airport Operations	$21.65	244	284	40	0.35	60	1.8	1.6	$52,125	$24,079	6	19	53
488190	Other Support Activities for Air Transportation	$21.83	567	681	114	0.50	100	2.1	1.5	$135,173	$48,438	11	49	(54)
488210	Support Activities for Rail Transportation	$17.59	797	906	109	2.92	45	1.7	1.5	$28,344	$4,870	68	34	(8)
488330	Navigational Services to Shipping	$19.20	1,253	1,220	(33)	4.58	171	2.0	1.5	$42,302	$6,133	100	14	112
488390	Other Support Activities for Water Transportation	$19.01	88	84	(4)	0.60	(32)	1.7	1.6	$17,090	$8,048	7	8	9
488410	Motor Vehicle Towing	$17.30	469	666	197	0.74	74	1.5	1.6	$65,315	$24,598	3	83	103
488490	Other Support Activities for Road Transportation	$17.23	170	243	73	0.50	46	1.5	1.5	$33,419	$17,602	3	35	32
488510	Freight Transportation Arrangement	$18.83	2,624	2,619	(5)	0.96	375	1.7	1.5	$339,079	$103,570	5	173	(199)
488999	All Other Support Activities for Transportation	$17.58	98	131	33	1.15	38	1.4	1.5	$9,812	$4,191	13	9	53
492110	Couriers and Express Delivery Services	$17.11	22,845	24,610	1,765	2.89	3,156	1.9	1.5	$542,485	$27,124	103	203	2,101
493110	General Warehousing and Storage	$14.74	12,528	16,169	3,641	2.05	3,427	1.5	1.5	$573,971	$28,698	32	201	(251)
493120	Refrigerated Warehousing and Storage	$14.75	164	157	(7)	0.22	6	1.6	1.5	$52,700	$41,531	4	7	(27)
493190	Other Warehousing and Storage	$14.75	608	1,157	549	1.55	303	1.5	1.5	$54,641	$2,732	21	60	406
	Total	$17.44	71,763	80,824	9,061	--	11,120	--	--	$6,296,558	$604,932	--	2,459	--

Source: EMSI Complete Data – 3rd Quarter 2010.

Transportation, Distribution, and Logistics Employment Distribution



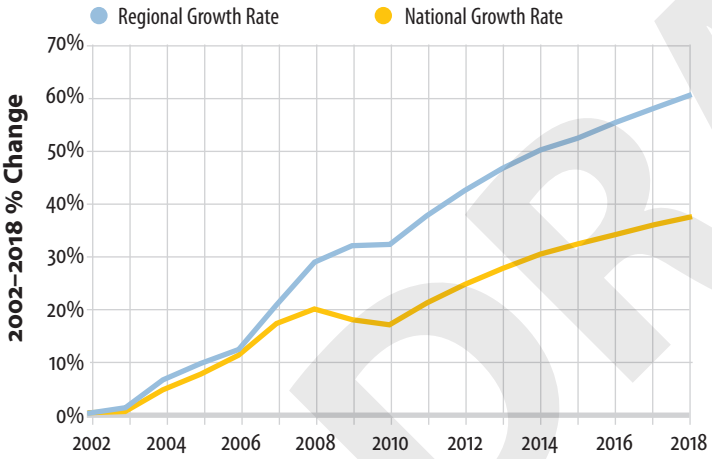
Transportation, Distribution, and Logistics 2002–2010 Employment Change



Business Services and Research & Development

Basic Information[8]

The business services and research & development sector has consistently grown over the last eight years and notably outperformed national growth. The recent economic downturn leveled off some of the growth, but the sector is projected to continue growing well into the next few years. As a whole, the sector pays well above family-sustaining wages and many of the sectors would be characterized as small and/or entrepreneurial, innovation-oriented businesses, such as engineering services; industrial design services; and research and development in biotechnology.



Description	2002 Jobs	2018 Jobs	Change	% Change	2010 EPW	2010 Establishments
State Total	84,407	135,005	50,598	60%	$60,955	9,410
National Total	9,863,098	13,521,061	3,657,963	37%	$80,668	888,603

Source: EMSI Complete Employment—4th Quarter 2010

8 Region denotes the Commonwealth of Kentucky

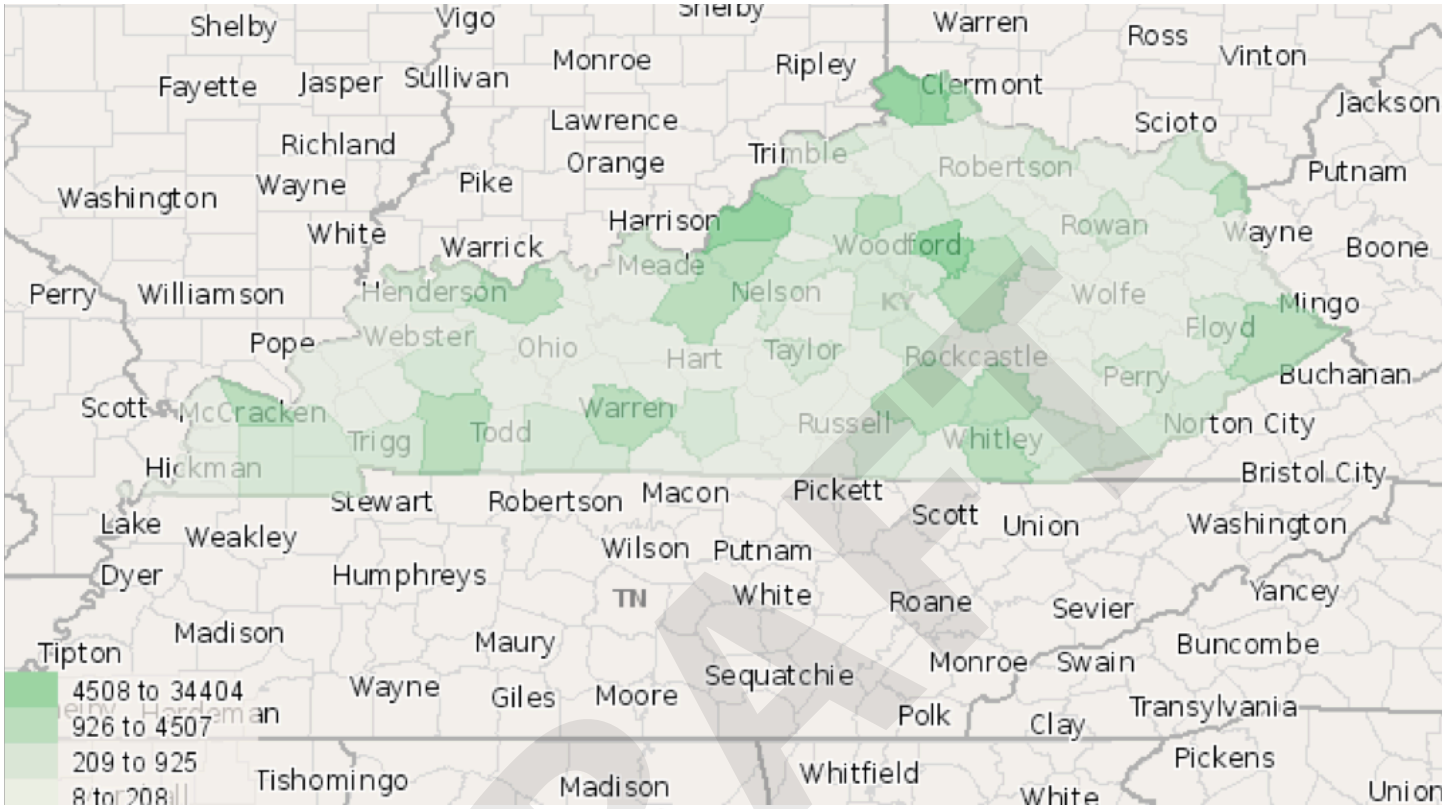
Industry Summary Table

Industry-level data show that opportunities exist to fill demand gaps in several services areas (*e.g.*, lawyers; certified public accountants, payroll services; engineering services; and research and development in biotechnology). Though the concentration of this sector is lower than the average concentration in the country, significant growth is projected to place the Commonwealth in an increasingly competitive position. As a whole, the business services and research & development sector pays well above family-sustaining wages. Analysis of the workforce characteristics indicates that approximately 1 out of 5 workers are compatible with the critical skill requirements of the sector. (Note: roughly 50% of the jobs in the sector have skill level that requires some form of postsecondary training or significant on-the-job training. This is predominately driven by lawyers, title abstract/settlement offices, accountant, engineering services, industrial design services, and computer related services.)

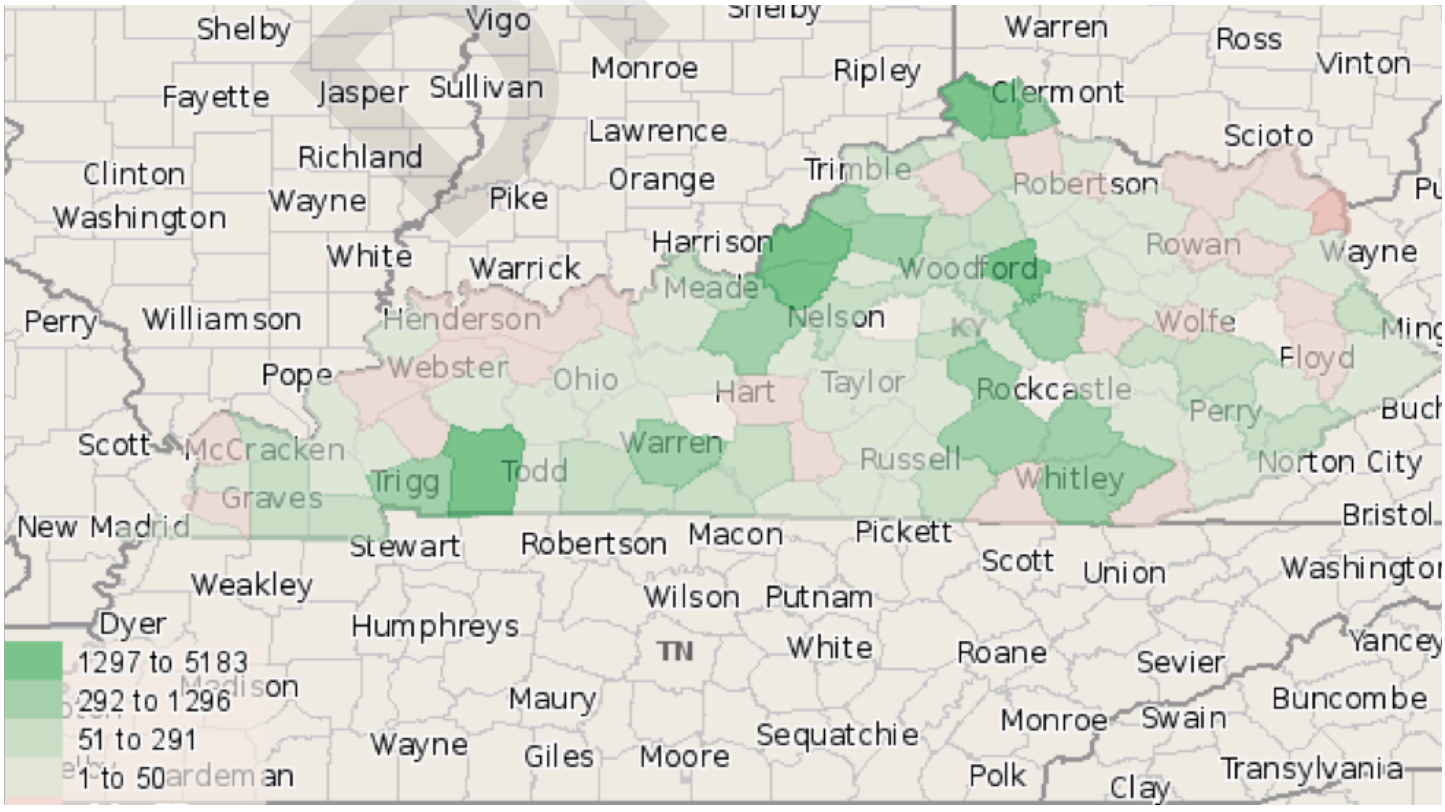
NAICS Code	Description	Average Wage	2002 Jobs	2010 Jobs	Change	2010 National LQ	2010–2018 Projected Change	Jobs Mult	Earnings Mult	Total Req's (K)	Imports (K)	Exports per job (K)	2009 Estab	Shift Share
541110	Offices of Lawyers	$25.57	13,368	13,802	434	0.75	2,948	2.1	1.6	$2,479,998	$965,064	6	2130	174
541191	Title Abstract and Settlement Offices	$25.74	486	682	196	0.71	244	1.8	1.6	$88,867	$29,364	7	112	160
541211	Offices of Certified Public Accountants	$19.42	4,112	4,490	378	0.73	977	2.0	1.6	$675,215	$237,504	7	634	315
541213	Tax Preparation Services	$15.44	2,560	3,024	464	0.95	665	1.3	1.6	$95,550	$8,694	3	331	(184)
541214	Payroll Services	$19.48	833	859	26	0.40	(5)	1.6	1.6	$176,306	$120,088	6	122	(134)
541219	Other Accounting Services	$16.76	8,508	8,540	32	1.16	1,159	1.7	1.6	$383,627	$19,181	36	559	(542)
541330	Engineering Services	$24.88	7,874	8,535	661	0.65	2,888	2.4	1.7	$2,075,661	$1,450,266	81	737	45
541420	Industrial Design Services	$15.83	53	134	81	0.37	73	2.0	1.6	$29,291	$18,974	25	28	61
541511	Custom Computer Programming Services	$25.08	3,917	4,668	751	0.41	758	1.8	1.4	$1,133,548	$736,806	4	606	(61)
541512	Computer Systems Design Services	$25.41	4,007	6,297	2,290	0.55	2,432	1.7	1.4	$1,344,310	$867,479	4	899	786
541513	Computer Facilities Management Services	$27.90	1,595	2,274	679	2.51	926	1.9	1.5	$101,098	$5,055	72	46	829
541519	Other Computer Related Services	$27.03	1,010	2,911	1,901	1.56	1,891	1.6	1.5	$207,303	$10,365	6	133	2,136
541611	Administrative Management and General Management Consulting Services	$19.73	3,367	6,277	2,910	0.60	4,020	1.9	1.6	$1,006,999	$714,762	56	567	1,199
541612	Human Resources Consulting Services	$18.34	616	784	168	0.55	243	1.8	1.6	$169,397	$150,466	63	92	266
541613	Marketing Consulting Services	$19.97	827	2,524	1,697	0.58	2,111	1.6	1.6	$310,447	$249,408	42	224	1,077
541614	Process, Physical Distribution, and Logistics Consulting Services	$21.68	675	2,352	1,677	1.33	2,535	1.7	1.6	$149,243	$93,570	58	193	1,419
541620	Environmental Consulting Services	$20.80	1,114	1,494	380	0.83	903	1.8	1.6	$164,057	$50,598	12	119	8
541690	Other Scientific and Technical Consulting Services	$19.85	1,449	2,774	1,325	0.64	2,066	1.9	1.6	$400,264	$144,527	5	264	(766)
541711	Research and Development in Biotechnology	$24.92	421	431	10	0.21	109	2.5	1.8	$555,567	$492,016	8	46	(76)
541712	Research and Development in the Physical, Engineering, and Life Sciences (except Biotechnology)	$24.55	1,035	1,131	96	0.18	284	2.6	1.8	$1,497,810	$1,326,349	8	90	(135)
541720	Research and Development in the Social Sciences and Humanities	$22.01	303	292	(11)	0.32	38	2.4	1.8	$163,170	$121,379	8	35	27
541840	Media Representatives	$18.43	315	422	107	0.81	89	2.2	1.7	$67,107	$22,073	26	38	141
541850	Display Advertising	$19.60	333	1,103	770	1.69	641	1.7	1.7	$52,480	$12,801	35	65	704
541930	Translation and Interpretation Services	$16.59	318	604	286	0.55	202	1.3	1.5	$31,747	$15,607	8	21	27
541940	Veterinary Services	$17.22	3,825	4,881	1,056	1.11	1,510	1.7	1.7	$338,314	$16,915	30	465	83
541990	All Other Professional, Scientific, and Technical Services	$16.62	7,704	10,220	2,516	0.68	1,563	1.5	1.5	$968,230	$385,814	7	251	696
551114	Corporate, Subsidiary, and Regional Managing Offices	$24.34	13,783	19,615	5,832	0.79	944	2.6	1.7	$4,701,004	$1,103,444	18	590	4,781
	Total	$21.95	84,408	111,120	26,712	0.71	32,214	--	--	$19,366,612	$9,368,568	--	9,397	13,034

Source: EMSI Complete Data – 3rd Quarter 2010.

Business Services and Research & Development Employment Distribution



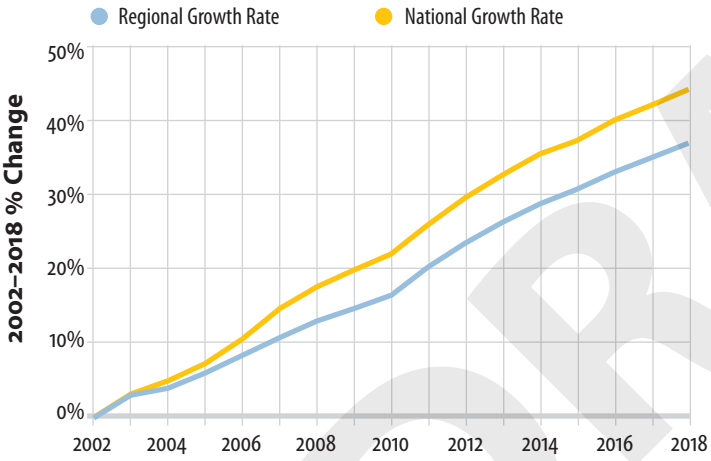
Business Services and Research & Development 2002–2010 Employment Change



Health Care/Social Assistance

Basic Information[9]

As seen across the U.S. the health care/social assistance sector has seen rapid growth over the last several years and is projected to continue this growth. Significant growth is projected for physicians; dentists; physical, occupational and speech therapists; freestanding ambulatory surgical and emergency centers; home health care; and nursing care facilities.



Description	2002 Jobs	2018 Jobs	Change	% Change	2010 EPW	2010 Establishments
State Total	209,061	286,117	77,056	37%	$48,641	9,935
National Total	15,414,462	22,198,839	6,784,377	44%	$49,919	784,485

Source: EMSI Complete Employment—4th Quarter 2010

9 Region denotes the Commonwealth of Kentucky

Industry Summary Table

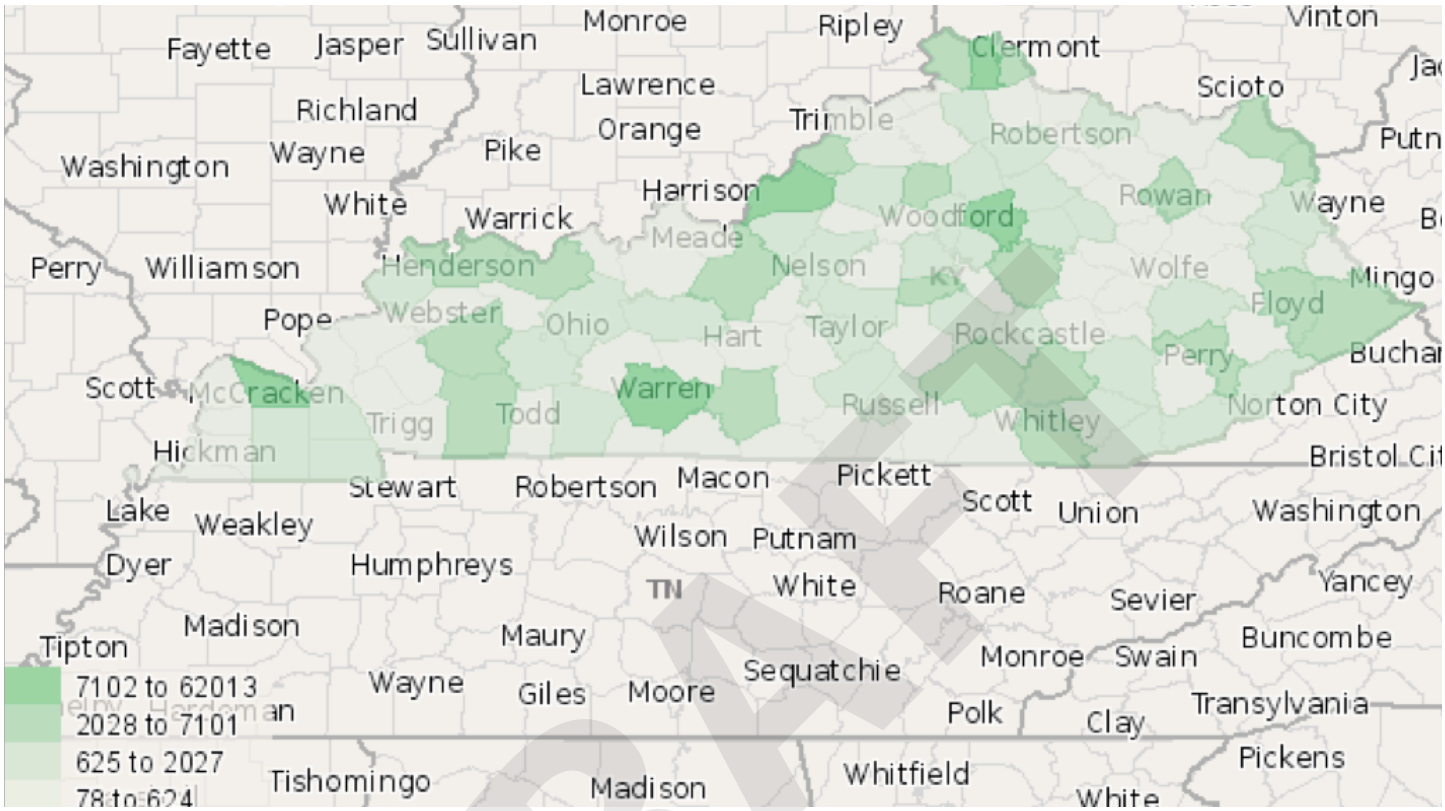
The health care and social assistance sector is largely defined as a non-export oriented sector, which is demonstrated by the comparatively low level of imports. Inasmuch, some sectors show strong excess demand potential, such as offices of physicians, dentists, offices of mental health practitioners, and HMO medical centers. Analysis of the workforce characteristics indicates that approximately 1 out of 5 workers are compatible with the critical skill requirements of the sector. (Note: roughly 50% of the jobs in the sector have skill level that require some form of postsecondary training or significant on-the-job training.)

NAICS Code	Description	Average Wage	2002 Jobs	2010 Jobs	Change	2010 National LQ	2010–2018 Projected Change	Jobs Mult	Earnings Mult	Total Req's (K)	Imports (K)	Exports per job (K)	2009 Estab	Shift Share
621111	Offices of Physicians (except Mental Health Specialists)	$28.17	31,415	35,471	4,056	1.05	6,349	2.3	1.6	$4,492,475	$224,627	26	2968	(1,278)
621210	Offices of Dentists	$23.45	8,912	10,582	1,670	0.87	2,404	1.7	1.6	$1,011,665	$217,396	4	1554	276
621310	Offices of Chiropractors	$20.81	1,583	2,165	582	1.00	627	1.6	1.6	$141,932	$8,649	3	519	342
621320	Offices of Optometrists	$21.37	1,402	2,016	614	1.16	367	1.8	1.6	$124,210	$6,210	28	272	347
621330	Offices of Mental Health Practitioners (except Physicians)	$20.45	1,307	1,512	205	0.51	274	1.6	1.5	$231,188	$128,564	4	122	(206)
621340	Offices of Physical, Occupational and Speech Therapists, and Audiologists	$23.59	3,859	6,119	2,260	1.18	2,080	1.7	1.6	$326,171	$16,308	26	384	61
621391	Offices of Podiatrists	$22.59	325	380	55	0.69	50	1.7	1.6	$46,313	$14,603	4	65	22
621399	Offices of All Other Miscellaneous Health Practitioners	$20.65	1,733	3,106	1,373	0.71	999	1.7	1.5	$282,182	$64,080	4	121	385
621420	Outpatient Mental Health and Substance Abuse Centers	$19.50	4,452	4,423	(29)	1.89	79	1.9	1.8	$194,236	$9,712	54	210	(987)
621491	HMO Medical Centers	$23.84	0	28	28	0.03	(13)	3.4	1.7	$164,513	$156,691	15	2	0
621492	Kidney Dialysis Centers	$23.84	840	1,280	440	1.00	787	2.1	1.8	$125,137	$6,257	16	75	103
621493	Freestanding Ambulatory Surgical and Emergency Centers	$23.84	578	2,224	1,646	1.72	1,994	2.2	1.8	$152,417	$7,621	52	47	1,295
621498	All Other Outpatient Care Centers	$23.84	1,083	1,365	282	0.95	629	2.4	1.8	$157,464	$7,873	35	77	(350)
621511	Medical Laboratories	$20.51	1,355	1,435	80	0.62	235	2.0	1.8	$268,377	$117,778	6	166	(254)
621512	Diagnostic Imaging Centers	$20.28	583	669	86	0.58	219	2.3	1.8	$157,041	$69,206	7	93	(119)
621610	Home Health Care Services	$16.53	10,120	11,367	1,247	0.59	3,103	1.6	1.5	$698,104	$34,905	4	275	(4,986)
621910	Ambulance Services	$14.84	2,043	2,294	251	0.98	30	1.8	1.8	$165,604	$8,280	19	74	(482)
621991	Blood and Organ Banks	$20.55	972	1,104	132	1.02	(10)	1.9	1.7	$93,170	$4,658	22	23	(157)
622110	General Medical and Surgical Hospitals	$21.89	59,159	64,930	5,771	1.10	6,651	2.0	1.7	$6,284,895	$314,244	15	132	(1,374)
622210	Psychiatric and Substance Abuse Hospitals	$21.89	2,852	3,409	557	2.52	467	1.7	1.7	$111,293	$5,565	54	22	174
622310	Specialty (except Psychiatric and Substance Abuse) Hospitals	$21.89	2,978	3,847	869	1.43	864	2.0	1.7	$256,530	$12,827	45	18	(396)
623110	Nursing Care Facilities	$14.26	27,680	29,859	2,179	1.33	5,197	1.5	1.6	$1,166,160	$58,303	19	323	769
623210	Residential Mental Retardation Facilities	$13.52	2,190	4,350	2,160	0.78	616	1.7	1.6	$243,639	$12,182	25	92	1,838
623220	Residential Mental Health and Substance Abuse Facilities	$15.11	1,544	1,821	277	0.68	(193)	1.6	1.6	$139,439	$22,700	3	56	(127)
623311	Continuing Care Retirement Communities	$13.16	1,813	1,723	(90)	0.32	(33)	1.5	1.6	$217,043	$132,449	3	32	(1,283)
623312	Homes for the Elderly	$13.14	1,756	2,978	1,222	0.59	1,023	1.4	1.6	$201,764	$70,995	2	104	934
623990	Other Residential Care Facilities	$14.23	2,553	2,806	253	1.18	54	1.6	1.6	$127,047	$6,352	20	75	214
624110	Child and Youth Services	$15.09	1,303	2,059	756	0.65	475	1.4	1.6	$147,685	$56,051	2	106	434

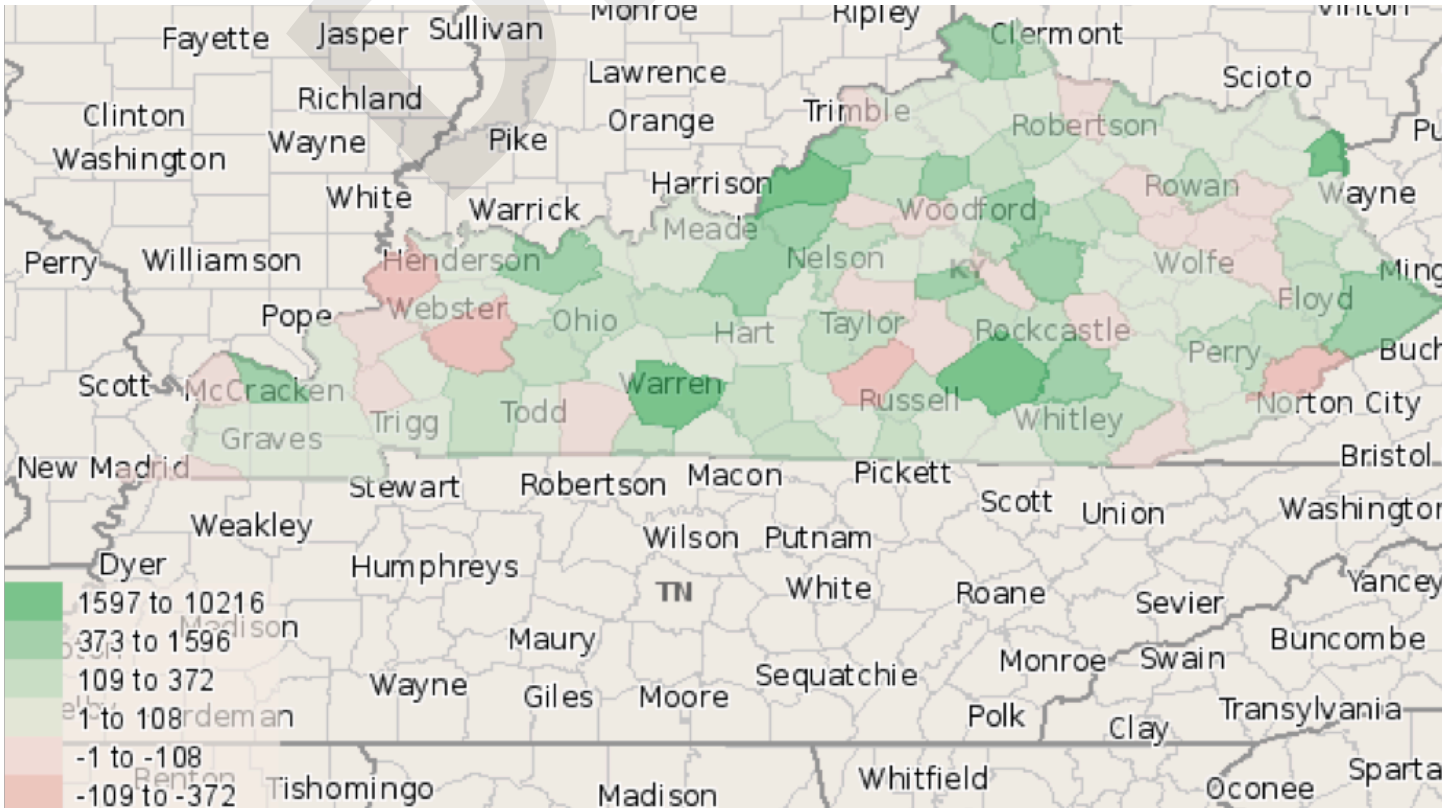
NAICS Code	Description	Average Wage	2002 Jobs	2010 Jobs	Change	2010 National LQ	2010–2018 Projected Change	Jobs Mult	Earnings Mult	Total Req's (K)	Imports (K)	Exports per job (K)	2009 Estab	Shift Share
624120	Services for the Elderly and Persons with Disabilities	$13.58	3,209	5,968	2,759	0.58	3,524	1.3	1.6	$286,876	$96,098	2	234	(314)
624190	Other Individual and Family Services	$15.89	4,691	6,274	1,583	0.92	1,467	1.4	1.6	$311,634	$15,582	3	417	(94)
624210	Community Food Services	$13.67	173	177	4	0.37	(5)	1.5	1.6	$20,935	$12,045	3	14	(10)
624221	Temporary Shelters	$15.86	509	689	180	0.80	95	1.5	1.6	$40,197	$5,391	3	36	74
624229	Other Community Housing Services	$14.75	137	321	184	0.66	103	1.6	1.6	$25,356	$6,210	3	18	129
624230	Emergency and Other Relief Services	$15.36	400	435	35	0.99	40	1.5	1.6	$30,503	$9,161	3	32	26
624310	Vocational Rehabilitation Services	$15.39	3,835	3,690	(145)	0.74	329	1.5	1.6	$216,691	$37,757	3	149	(495)
624410	Child Day Care Services	$10.58	19,716	22,065	2,349	0.89	2,030	1.2	1.5	$589,609	$136,563	1	1061	(1,269)
	Total	$19.58	209,060	244,941	35,881	--	42,907	--	--	$19,249,496	$2,113,895	--	9,968	--

Source: EMSI Complete Data – 3rd Quarter 2010.

Health Care/Social Assistance Employment Distribution



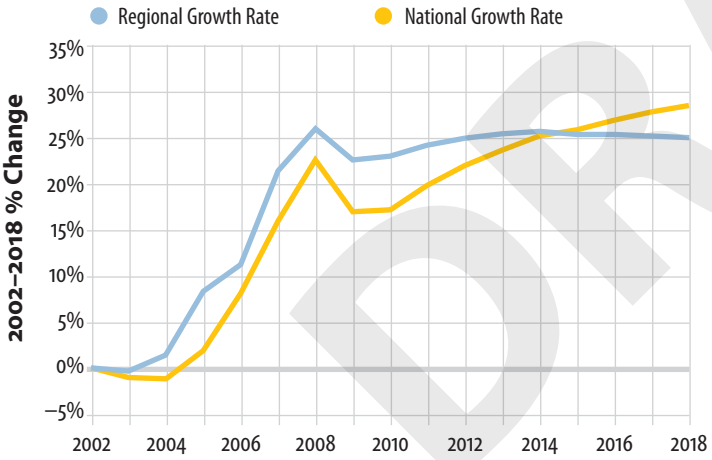
Health Care/Social Assistance 2002–2010 Employment Change



Energy Creation/Transmission

***Basic Information*[10]**

Energy creation and transmission experienced rapid, significant growth between 2003 and 2008, followed by a slight decline between 2008 and 2009. The industry is projected to have low to moderate growth over the next several years; however, domestic and international energy market conditions, infrastructure investment and new research and development can quickly change this projection. For example, Argonne National Laboratory has partnered with the University of Kentucky and the University of Louisville to help develop and deploy advanced battery technologies for use in vehicles. Additionally, the outcome of the current discussion and debate on development of nuclear power can also change the future of this sector.



Description	2002 Jobs	2018 Jobs	Change	% Change	2010 EPW	2010 Establishments
State Total	11,655	14,553	2,898	25%	$81,987	615
National Total	883,005	1,132,944	249,939	28%	$99,778	36,023

Source: EMSI Complete Employment—4th Quarter 2010

10 Region denotes the Commonwealth of Kentucky

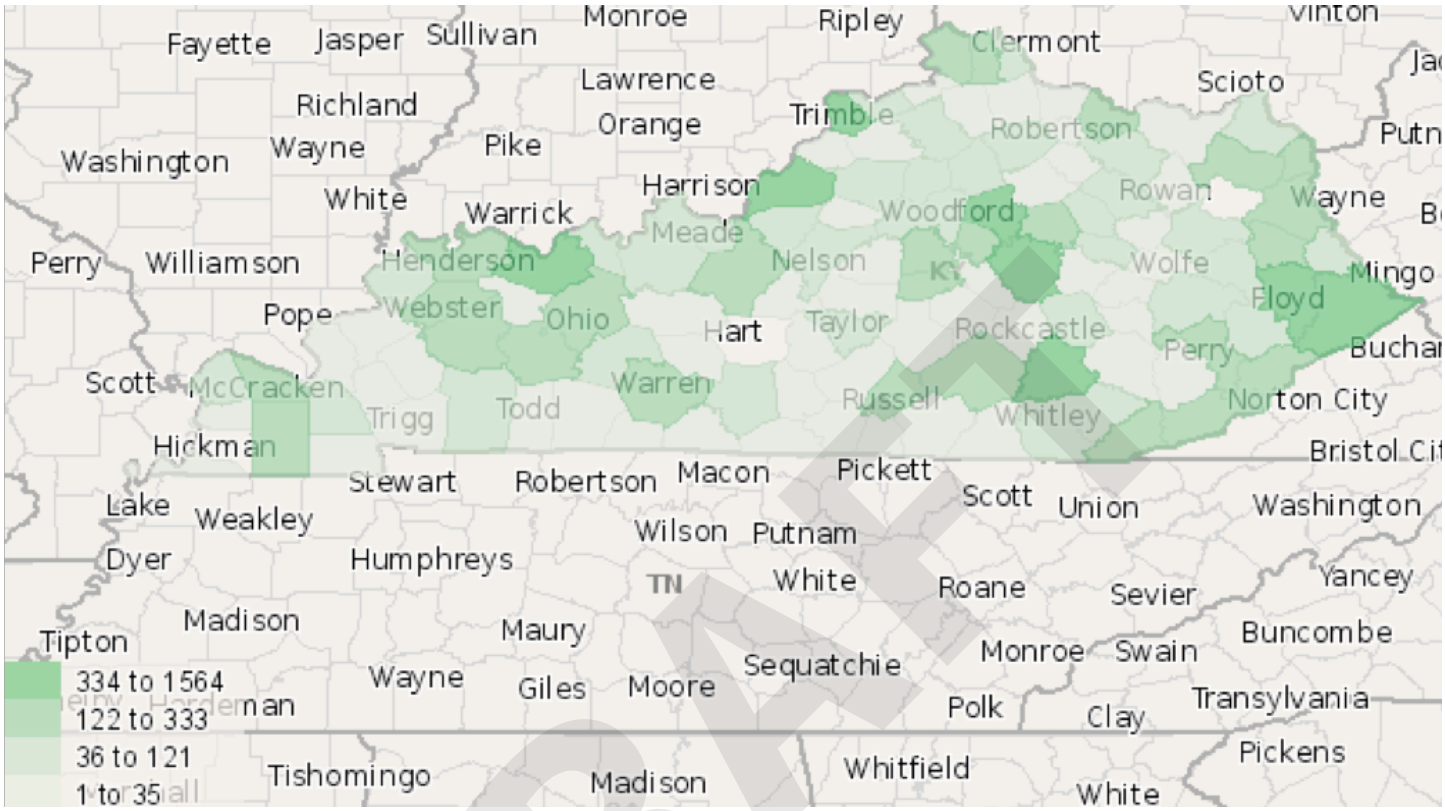
Industry Summary Table

From the data, Kentucky clearly has an industry advantages in energy creation and transmission, specifically in support activities for coal mining; alternative electric power generation; electric power distribution; storage battery manufacturing; and natural gas pipelines. Secondly, given robust supply-chain requirements for the industries, this sector tends to have high job multiplier effects, meaning additional job creation creates many additional jobs within the Commonwealth.

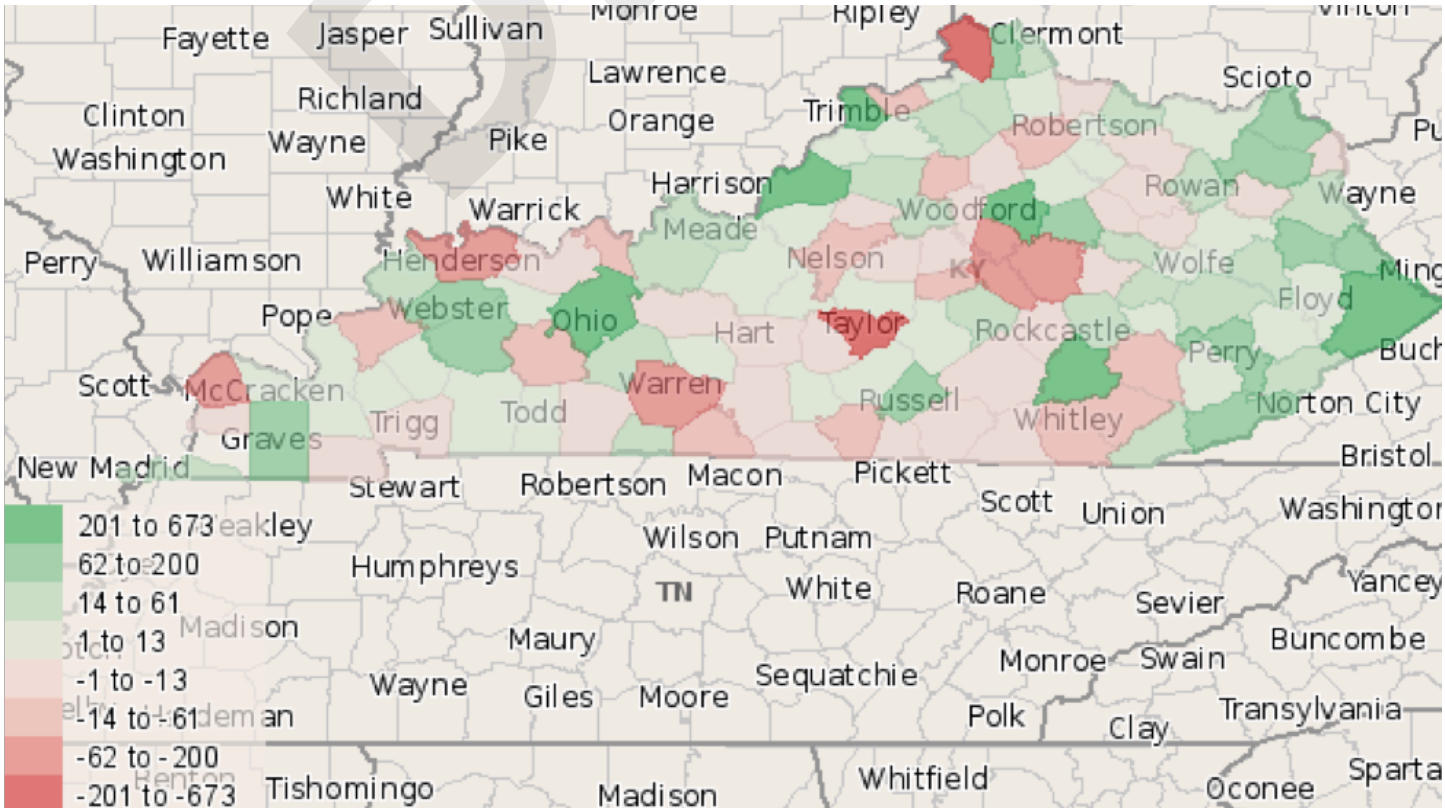
NAICS Code	Description	Average Wage	2002 Jobs	2010 Jobs	Change	2010 National LQ	2010–2018 Projected Change	Jobs Mult	Earnings Mult	Total Req's (K)	Imports (K)	Exports per job (K)	2009 Estab	Shift Share
221112	Fossil Fuel Electric Power Generation	$23.53	1,723	1,695	(28)	0.93	(214)	4.7	2.5	$1,292,064	$121,156	36	30	134
213112	Support Activities for Oil and Gas Operations	$19.92	507	984	477	0.31	(26)	2.3	1.9	$613,828	$455,274	8	71	70
213113	Support Activities for Coal Mining	$19.84	553	1,928	1,375	14.74	(109)	4.3	3.1	$105,943	$5,297	449	97	664
221119	Other Electric Power Generation	$23.61	296	492	196	3.01	21	4.4	2.2	$94,939	$4,747	576	19	135
221121	Electric Bulk Power Transmission and Control	$23.45	128	364	236	1.01	6	4.7	2.5	$227,465	$11,373	179	4	238
221122	Electric Power Distribution	$23.21	2,681	2,783	102	1.36	(251)	4.9	2.7	$1,153,817	$57,691	205	98	(220)
221210	Natural Gas Distribution	$20.00	780	642	(138)	0.42	(82)	4.9	3.3	$1,438,974	$942,876	41	63	(117)
237120	Oil and Gas Pipeline and Related Structures Construction	$18.99	655	921	266	0.66	308	2.1	1.7	$185,474	$79,760	6	59	79
237130	Power and Communication Line and Related Structures Construction	$21.24	2,862	2,862	0	1.52	(293)	2.0	1.7	$247,005	$12,350	44	127	(170)
335911	Storage Battery Manufacturing	$18.76	507	460	(47)	2.67	(140)	2.5	2.0	$53,584	$4,810	159	2	90
486210	Pipeline Transportation of Natural Gas	$24.12	962	900	(62)	2.68	(188)	5.1	2.7	$196,249	$9,812	433	54	99
486910	Pipeline Transportation of Refined Petroleum Products	$27.25	0	25	25	0.28	23	5.1	2.7	$30,214	$17,973	164	1	25
	Total	$21.67	11,654	14,056	2,402	--	(945)	--	--	$ 5,639,556	$ 1,723,119	--	625	--

Source: EMSI Complete Data – 3rd Quarter 2010.

Energy Creation/Transmission Employment Distribution



Energy Creation/Transmission 2002–2010 Employment Change



Appendix B – About the Data

Industry Data

In order to capture a complete picture of industry employment, EMSI basically combines covered employment data from Quarterly Census of Employment and Wages (QCEW) produced by the Department of Labor with total employment data in Regional Economic Information System (REIS) published by the Bureau of Economic Analysis (BEA), augmented with County Business Patterns (CBP) and Nonemployer Statistics (NES) published by the U.S. Census Bureau. Projections are based on the latest available EMSI industry data, 15-year past local trends in each industry, growth rates in statewide and (where available) sub-state area industry projections published by individual state agencies, and (in part) growth rates in national projections from the Bureau of Labor Statistics.

Input-Output Data (for multipliers, total requirements, imports and exports per job)

The input-output model in this report is created using the national Input-Output matrix provided by the federal Bureau of Economic Analysis. This is combined with the national Total Gross Output, the regional Total Gross Output, the land area of the subject region, regional DIRT (dividends, interest, rent and transfers) data and regional in/out commuter patterns in order to calculate regional requirements, imports and exports. After using matrix algebra to calculate the regional multiplier, the resulting matrix is multiplied by the sales vector and converted back to jobs or earnings. Specifically, this data comes from the U.S. Department of Commerce, Bureau of Economic Analysis, Industry Economic Accounts: Benchmark & Annual Input-Output (I-O) Accounts.

State Data Sources

This report also uses state data from the following agencies: Kentucky Office of Employment and Training.